

MEDICAL TECHNOLOGIST
CS-644-11

INTRODUCTION

This position is located in the Office of the Deputy Mayor for Public Safety and Justice (ODMPSJ) in the Department of Forensic Sciences (DFS). The mission of the DFS is to provide high-quality, timely, accurate, and reliable forensic science services using best practices and best available technology, focusing on unbiased science and transparency, to enhance public safety and health.

Medical technologist performs and advises on laboratory testing of human blood, urine, and other body fluids or tissues, using manual or automated techniques; confirms test results and develop data which may be used in determining the presence and extent of disease or in support of research; modifying or designing laboratory procedures; establishing and monitoring quality control systems and measures; providing basic theory, technical skills, and application of laboratory test procedures; and insures compliance with accrediting and regulatory agency requirements.

MAJOR DUTIES

Performs complex analysis e.g., microscopy, immunology, virology, biology, bacteriology, hematology and chemical tests and provides their results.

Prepares clinical specimens from throat, urine, wounds, eyes, feces, etc., for microbiological analyses by inoculation of appropriate media and by microscopic examination of specimens (gram stain), etc. prepares cultures of tissue samples, establishes and monitors programs that ensure data accuracy; and analyzes lab reports for accuracy; and prepares samples for examination, using automated equipment and specialized instrumentation, performing numerous complicated tests simultaneously and accurately interpreting the results.

Identifies viruses and bacteria specimens from clinical and referral laboratories by growth, physiological, enzymatic and biochemical characteristics, and nucleic acid testing; and collects and study samples to determine the morphology; performs scientific procedures of advanced complexity, such as nucleic acid extraction for PCR testing and identification of microbial, viral and mycological agents and identifies bacteria and fungi and viruses by immunofluorescence microscopy; and enterotoxin testing by enzymatic immune assays (EIA) as well as time resolved fluorescence (TRF) as required by protocols in use. Determines the susceptibility of bacteria to antimicrobial agents by disc, broth and/or automated methods.

Evaluates new test procedures or schemes to identify bacteria for the development and evaluation of techniques and media to identify more rapidly and to isolate bacteria that are difficult to culture in standard media; and identifies and confirms the serotypes *E. coli*, *Shigella* and *Salmonellae* by somatic and flagellar antigen as well as by pulse field gel electrophoresis; and determines the susceptibility of bacteria to antimicrobial agents by disc, broth and/or automated methods; also makes recommendations regarding these procedures under the direction of the supervisor to the department Director or designee. Participates in proficiency testing programs which are devised by such agencies

as the College of American Pathologists, Centers for Disease Control and Prevention in order that unknown specimens can be analyzed and the results compared to established values on a national level.

Receives accessions, and logs specimens into the Laboratory Information Management System (LIMS); prepares reports and maintains records of work performed on patient specimen, reagents, media, file records; and maintains a log of supplies used in the laboratory and keeps area stocked with supplies. Periodically compile and collate data requested for daily specimen intake statistics and for evaluation reports. When required prepares specimens to be stored or transported to the reference laboratory.

Evaluates, modifies, or adapts new methods or revises standard techniques to improve or expand quantitiveness, accuracy, precision, specificity, or proficiency of analyses; and reviews current literature for improved quality control procedures; and evaluates new quality control protocols to determine their suitability for use, and determines if additional information is needed for clarification of test results and/or to establish a definitive diagnosis, and confers with other staff on additional tests as necessary. Under the direction of a supervisory microbiologist the incumbent test and evaluate newly developed procedures and makes recommendations regarding these procedures to the Director or designee.

Operates, maintains, calibrates and conducts performance check on clinical instruments and scientific equipment and performs preventive maintenance on these instruments and quality control procedures for those instruments as outlined in the manufacturer's instructions and operation manuals; and conducts periodic inventory of reagents materials and equipment necessary for uninterrupted laboratory testing.

Assists with training lower level and/or new employees and students on special techniques and practical aspects of quality assurance.

Performs other related duties as assigned.

FACTORS

KNOWLEDGE REQUIRED BY THE POSITION

Professional knowledge of medical technology concepts, principles, and practices sufficient to develop and implement a full-service laboratory program; and the full range of special tests and non-routine procedures in addition to standardize procedures. Professional knowledge sufficient to enable the incumbent to effectively carried out assignment in a laboratory setting.

Thorough knowledge of immunology, virology and microbiology in order to perform the appropriate lab tests and to make positive analysis as well as in-depth knowledge and skill sufficient to determine quality control measures establish and monitor quality control. Knowledge of HIV-ELISA assays, EIA for hepatitis; DNA rapid probe test for *Nesseria gonorrhea*, *Chlamydia trachomatis*; ELISA assays for vaccine preventable diseases; and of Western Blot assay for confirmation of HIV.

Knowledge of recognized reference standards, medico legal responsibilities, accrediting agency requirements, and Federal and State laws and regulations sufficient to ensure that section plans and procedures are consistent with requirements.

Knowledge of quality control, workload reporting, and proficiency testing to design programs to assure the reliability of data and measure laboratory productivity.

Management, administrative, and professional knowledge sufficient to enable the incumbent to effectively manage the work carried out in a laboratory.

Skill and ability to evaluate new tests and instruments, modify and adapt standard methods and procedures.

Skill and ability to use a PC and software packages (e.g., Microsoft Word, Excel, Access and Power Point, etc.) and software applicable to various reporting systems, particularly laboratory information systems (LIS), inventory control, and sequence analysis software.

Knowledge of accrediting and regulatory agency requirements sufficient to ensure that quality control procedures are in compliance with such requirements.

SUPERVISORY CONTROLS

The supervisor assigns the work in terms of overall objectives and program emphasis and works with the incumbent to develop projects and deadlines.

Independently plans and carries out the quality control program, selects the methods to use, resolves most technical problems, and coordinates and implements the approved program with laboratory staff. Keeps the supervisor informed of deficiencies in test performance and controversial matters, or far-reaching implications.

Completed work is reviewed for effectiveness in meeting accrediting and regulatory agency requirements and overall management objectives of data reliability.

GUIDELINES

Guidelines consists of policies, procedures, rules and regulations of the District of Columbia Government, DFS, and all other requirements and restrictions set forth in pertinent legislation. Other guides include established and/or experimental protocols, technical manuals and journals, American Public Health Association Standard Diagnostic Methods, Manual of Clinical Laboratory Microbiology (American Society of Microbiology) D.C. Department of Health, and the U.S. Public Health Service.

Guidelines do not cover every situation (e.g., confirming unusual test results; performing analyses when known reference materials or media are unavailable; assessing and correcting unexpected reactions and errors).

Judgment is utilized when interpreting and adapting guidelines and precedents for application to specific cases or problems in accordance with established policies and accepted theories; and recommending changes to procedures to improve the reliability of data, enhance services, correct

deficiencies, etc. Approval from the supervisor is required for any deviation from the established protocol.

COMPLEXITY

The work involves different processes, methods, and analyses, many of which are complex and require a detailed understanding of technical procedures applicable to the diagnosis of infectious diseases and the identification of specific bacteria pathogens. The work also involves collecting and preparing specimens, preparing and controlling reagents, calibrating or standardizing and maintaining instruments, and performing complex analyses; conducting quality control procedures on equipment, reagents, and products; setting up, standardizing, and implementing new procedures. Analyzes and interpret the conditions and elements leading to clarification and verification of test results.

Decisions regarding what needs to be done depend upon the analysis and evaluation of collection techniques and conditions, specimen characteristics, adequacy of reagents, instrument performance, acceptability of control samples, results of quality control procedures, and other variables. The chosen course of action may have to be selected from many alternatives, as, for example, when standards or control samples do not give acceptable values.

SCOPE AND EFFECT

The purpose is to perform/monitor the full range of specialized and non-routine tests according to established methods; reviewing and analyzing conventional testing problems and recommending or implementing solutions to overcome them; and setting up and developing protocols for new procedures. Also performs microbiological examinations of clinical specimens that have been obtained from hospitals, other laboratories, clinics and private physicians in the District of Columbia Health Care System. Tests are also conducted to identify pathogenic microorganisms in the specimen submitted.

These results directly affect the diagnosis and treatment of a wide variety of infectious diseases; and the adequacy of clinical laboratory services or research conclusions (and hence the correct diagnosis and treatment of patients), the efficient operation of laboratory system and programs, and the effective management of laboratory resources.

PERSONAL CONTRACTS

Personal contacts are with individuals or groups from outside the employing agency in a moderately unstructured setting (e.g., where the contacts are not established on a routine basis, the purpose and extent of each contact is different, and the role and authority of each party is identified and developed during the course of the contact). Typical of contacts at this level are those with persons in their capacities as physicians, students, trainees, messengers, researchers, or representatives of other Federal agencies, State or local health departments, professional organizations, etc

Interaction with the Director or other managers is to clarify or present pertinent laboratory reports.

PURPOSE OF CONTACTS

The purpose of contacts is to plan or coordinate work efforts or to resolve operating problems by influencing or motivating individuals or groups who are working toward mutual goals and who have basically cooperative attitudes (e.g., coordinating work efforts or resolving operating problems concerning test methods, unexpected results, schedules, etc., with other laboratory workers and physicians; instructing students in basic theory and/or technical skills; clarifying problems of equipment use, test accuracy, etc., with reference laboratories, product suppliers, or equipment manufacturers; advising laboratory managers or State representatives on the need for or the results of inspections; and promoting conformity to safety plans and standards.

PHYSICAL DEMANDS

The work requires regular and recurring physical exertion such as prolonged standing, bending over microscopes, reaching for supplies or materials, and lifting moderately heavy items such as centrifuges and record boxes (or occasionally lifting heavier items such as reagent packs). The work may require specific physical characteristics and abilities such as dexterity and color vision; and may be required to lift up to twenty (20) pounds when moving containers of chemicals, test equipment, reagents, etc.

WORK ENVIRONMENT

The work involves regular and recurring exposure to moderate risks or discomforts which require special safety precautions (e.g., working in a laboratory where there is a risk of exposure to contagious diseases, carcinogenic materials, caustic reagents, noxious fumes, flammable liquids, and low-level radiation). The Incumbent is required to use protective clothing or gear such as laboratory coats, fume hoods, safety goggles, radiation badges, aprons, gloves, and shields, and to adopt sterile techniques.

SPECIAL REQUIREMENTS:

This position's duty station will be housed within the Consolidated Forensic Laboratory (CFL) which is a protection-sensitive facility. As such, incumbents of this position shall be subject to criminal background checks, background investigations, and mandatory drug and alcohol testing, as applicable.

The nature of the DFS mission necessarily involves the potential risks associated with biological or chemical hazards, including morgue functions. Although contact with these functions is intended to be minimal, the risks are nevertheless possible; training to recognize, address, and mitigate these risks is required as is dealing with potentially personally difficult topics, such as crime, death, and disease.